

Gonorrhea

Infections due to *Neisseria gonorrhoeae*, like those resulting from *Chlamydia trachomatis*, are a major cause of pelvic inflammatory disease (PID) in the United States. Occurrence of PID can lead to serious outcomes such as tubal infertility, ectopic pregnancy, and chronic pelvic pain. In addition, epidemiologic and biologic studies provide strong evidence that gonococcal infections facilitate the transmission of HIV infection.¹

Following a 73.9% decline in the reported rate of gonorrhea from 1975 to 1997, in 1998 the gonorrhea rate increased and has remained essentially unchanged through 2000 (Table 1). Although increased screening (usually associated with simultaneous testing for chlamydial infection), use of more sensitive diagnostic tests, and improved reporting may account for a portion of the recent increase, true increases in disease in some populations and geographic areas also appear to have occurred.²

As with chlamydial infection, reporting of gonorrhea cases to CDC is incomplete. In addition, reporting practices for gonococcal infections have likely been biased towards reporting of infections in persons of minority race or ethnicity who attend public STD clinics.^{2,3} As a result, for most areas, the number of gonorrhea cases reported to CDC are affected by many factors, only one of which is the occurrence of the infection within the population. For this reason, new data on gonorrhea prevalence in persons screened in a variety of different settings are useful in assessing disease burden in selected populations.

- In 2000, 358,995 cases of gonorrhea were reported in the United States (Table 1).
- Rates of reported gonococcal infections in the United States have been steady since 1998 at about 132 cases per 100,000 population (131.6 in 2000, 132.0 in 1999, and 131.6 in 1998) (Table 13). In the period from 1975 to 1997, the national gonorrhea rate had been generally declining following the implementation of the national gonorrhea control program in the mid-1970s (Table 1).
- In 2000, eight states and one outlying area reported gonorrhea rates below the Healthy People 2010 (HP2010) national objective of 19 cases per 100,000 persons⁴ (Figure 10 and Table 12).
- The gonorrhea rates in three of the four Census regions of the United States (Northeast, West, Midwest) increased between 1999 and 2000. However, the South had a 4.4% decrease in rates from 200.6 in 1999 to 191.8 in 2000. As in previous reporting years, the South had the highest reported gonorrhea rate in 2000 among the four regions of the country (Figure 11, Table 13).
- There was no meaningful change in the reported gonorrhea rate among women between 1999 and 2000 (128.7 and 128.3 cases per 100,000 females respectively). The gonorrhea rate in men remained the same with 134.7 and 134.6 cases per 100,000 males in 1999 and 2000, respectively. State-specific reported gonorrhea rates for both men and women were higher than the HP2010

objective of 19 cases per 100,000 persons in 42 states (Figure 12, Tables 14 and 15).

- The overall gonorrhea rate reported from selected large cities with populations over 200,000 persons was 234.9 cases per 100,000 persons in 2000. This rate is slightly higher than that reported for these cities in 1999 (232.5 cases per 100,000 persons) (Table 17). All of these 64 cities had reported rates higher than the HP2010 objective of 19 cases per 100,000 persons (Table 16).
- Changes in the reported 2000 gonorrhea rates, relative to those reported in 1999, differed depending on racial/ethnic group. For example, the rates among Hispanics (78.1 in 2000 and 69.9 in 1999) and Asian/Pacific Islanders (30.0 in 2000 and 20.9 in 1999) increased by 11.7% and 43.5% respectively between 1999 and 2000. The 2000 rate among American Indians/Alaska Natives (114.4 per 100,000) was 4.1% higher than the rate reported in 1999 (109.9 per 100,000). Rates among non-Hispanic whites had a similar increase between 1999 (26.9 per 100,000) and 2000 (28.0 per 100,000) while the rate among African-Americans decreased from 848.2 in 1999 to 827.0 in 2000 (Figure 13 and Table 20B). The 2000 gonorrhea rates for all racial/ethnic groups were above the HP2010 objective of 19 per 100,000 population. In 2000, the reported gonorrhea rate among African-Americans was about 30 times greater than the rate for non-Hispanic whites.
- Among women in 2000, 15- to 19-year-olds had the highest reported rate of gonorrhea (715.6 per 100,000), while among men, 20- to 24-year-olds had the highest rate (589.7 per 100,000) (Figure 14).
- In 2000, the median state-specific gonorrhea test positivity among 15 to 24-year old women screened in selected family planning clinics in 34 states and the Virgin Islands was 0.9% (range, 0.0% to 4.5%) (Figure 15).
- Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.^{5,6} Overall, 24.7% of isolates collected in 2000 by the Gonococcal Isolate Surveillance Project (GISP) were resistant to penicillin, tetracycline, or both (Figure 17).
- The proportion of GISP isolates demonstrating decreased susceptibility to ciprofloxacin, one of the currently recommended treatments for gonorrhea, decreased from a high of 1.3% in 1994 to 0.5% in 1996 and 1997, but since 1998 has been increasing annually and was 1.6% in 2000 (Figure 18).
- Resistance to ciprofloxacin was first identified in GISP in 1991. From 1991 to 1998, fewer than 9 ciprofloxacin-resistant isolates were identified each year and such isolates were identified in only a few GISP clinics. In 2000, similar to 1999, 19 (0.4%) ciprofloxacin-resistant GISP isolates were identified in 7 of the 25 GISP clinics. Notably, in Honolulu, the proportion of GISP isolates that were resistant to ciprofloxacin remained high and was 14.3% in 2000. This trend reinforces the recommendation made by CDC in 2000 that fluoroquinolones not be used to treat gonorrhea acquired in Hawaii.⁵ In 2000, there was also a high proportion of GISP isolates resistant to ciprofloxacin (5.6%) in Orange County, California.
- In 2000, all GISP isolates were susceptible to ceftriaxone and to cefixime. The proportion of GISP isolates demonstrating decreased susceptibility to ceftriaxone or cefixime has remained very low over time. To date, no cephalosporin resistance has been identified in GISP.

- The proportion of GISP isolates demonstrating elevated minimum inhibitory concentrations (MICs) to azithromycin has been increasing since GISP began monitoring azithromycin susceptibility in 1992. In 1992, 0.9% of GISP isolates had azithromycin MIC ≥ 0.5 $\mu\text{g/ml}$ compared with 2.4% in 2000. In 1992, there were no isolates with azithromycin MIC ≥ 1.0 $\mu\text{g/ml}$ but in 2000, there were 19 such isolates.
- The percentage of men with gonorrhea who were reported to have had a gonorrhea infection in the previous year, as measured by the GISP, decreased from 21.5% in 1992 to 17.2% in 1999 but then rose to 23.6% in 2000 (Figure 19).
- Additional information about gonorrhea in racial and ethnic minority populations, adolescents, and other at risk populations can be found in the **Special Focus Profiles** section.

¹Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. *Lancet* 1997;349:1868-73.

²Centers for Disease Control and Prevention. Gonorrhea – United States, 1998. *MMWR* 2000;49:538-42.

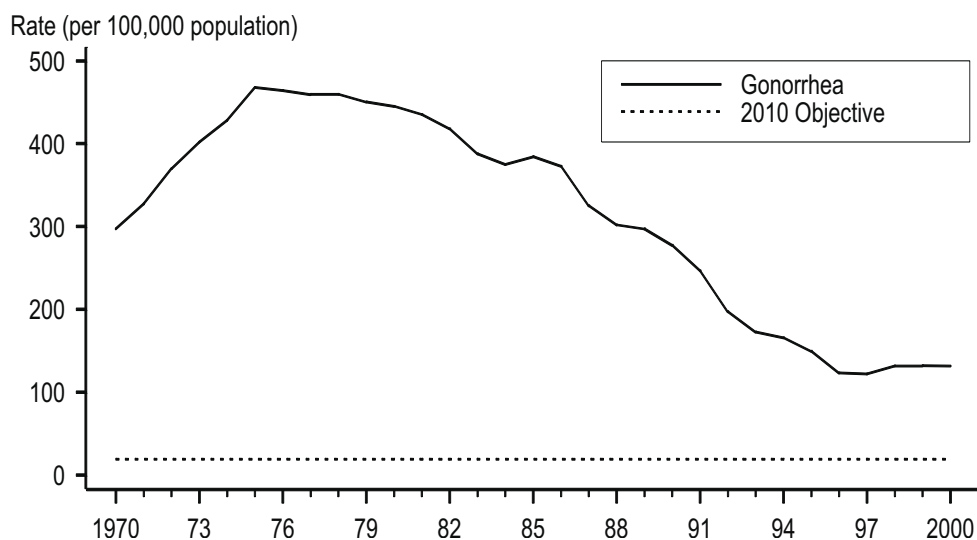
³Fox KK, Whittington W, Levine WC, Moran JS, Zaidi AA, Nakashima AN. Gonorrhea in the United States, 1981-1996: demographic and geographic trends. *Sex Transm Dis* 1998;25(7):386-93.

⁴U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

⁵Centers for Disease Control and Prevention. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49:833-837.

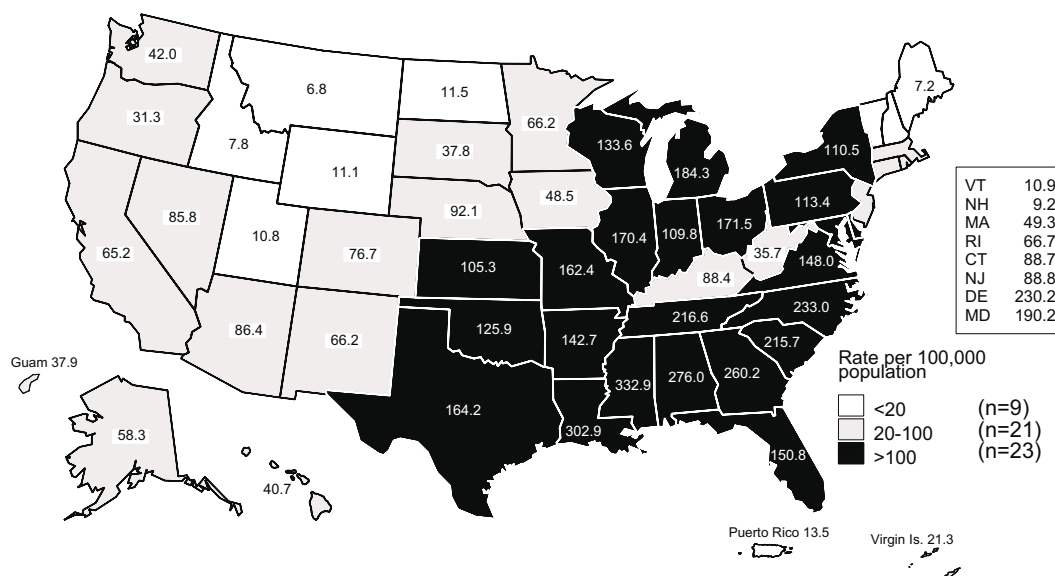
⁶Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2000 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report 2000*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2001 (in press).

Figure 9. Gonorrhea — Reported rates: United States, 1970–2000 and the Healthy People year 2010 objective



Note: The Healthy People 2010 (HP2010) objective for gonorrhea is 19.0 cases per 100,000 population.

Figure 10. Gonorrhea — Rates by state: United States and outlying areas, 2000



Note: The total rate of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 129.9 per 100,000 population. The Healthy People year 2010 objective is 19.0 per 100,000 population.

Figure 11. Gonorrhea — Rates by region: United States, 1981–2000 and the Healthy People year 2010 objective

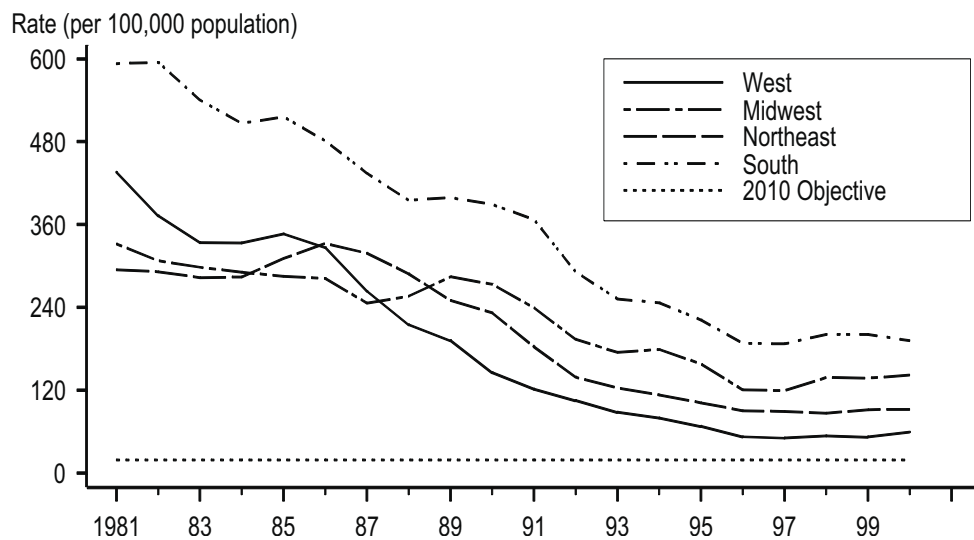


Figure 12. Gonorrhea — Rates by gender: United States, 1981–2000 and the Healthy People year 2010 objective

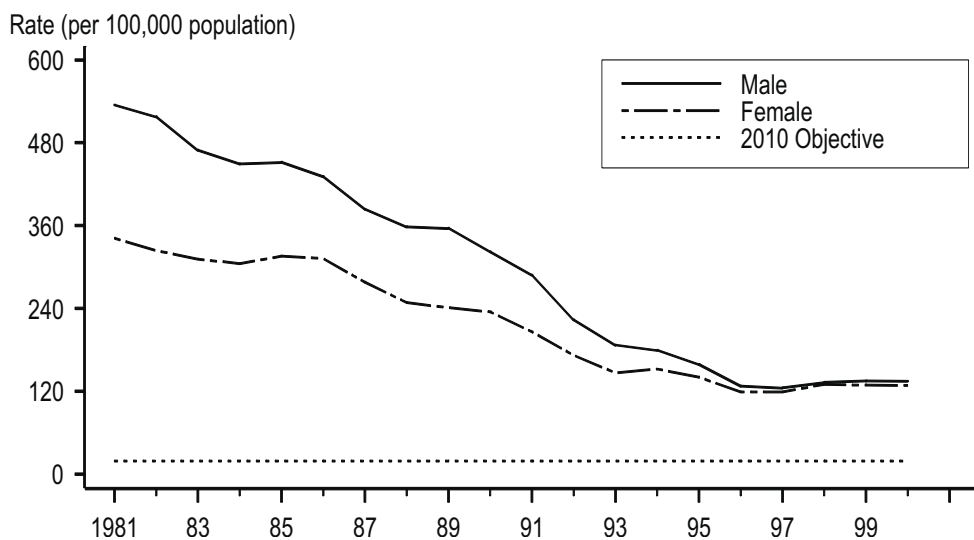


Figure 13. Gonorrhea — Rates by race and ethnicity: United States, 1981–2000 and the Healthy People year 2010 objective

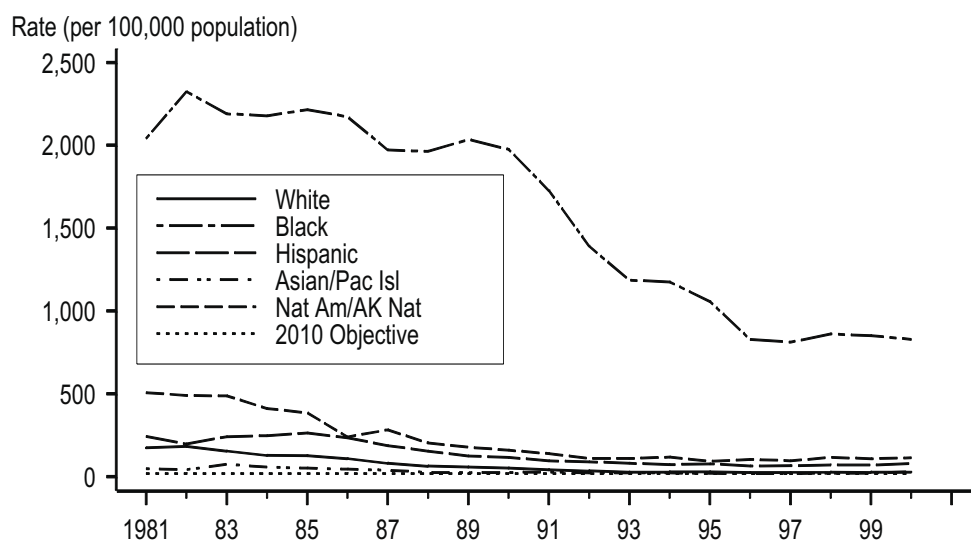
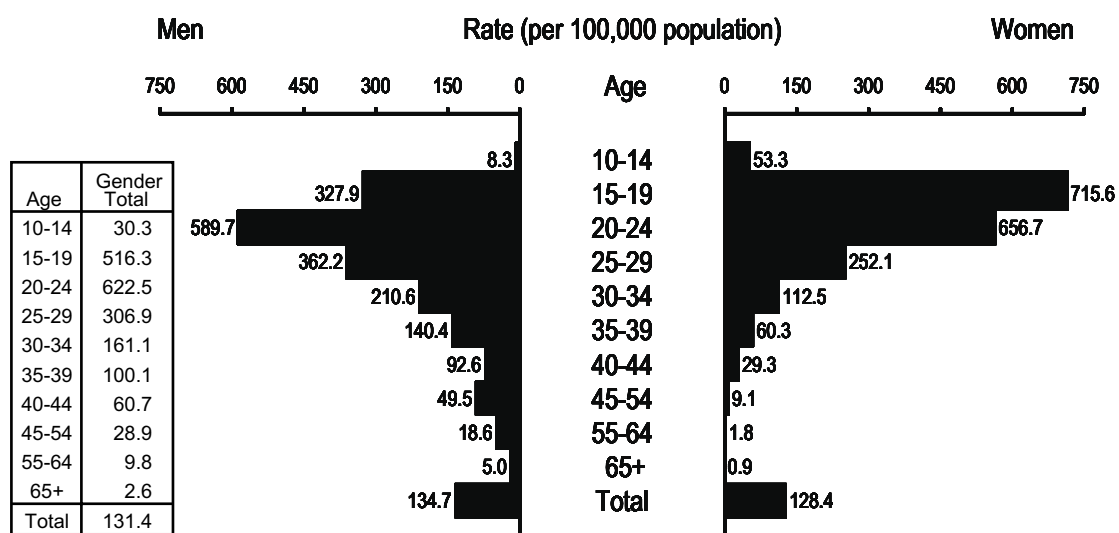
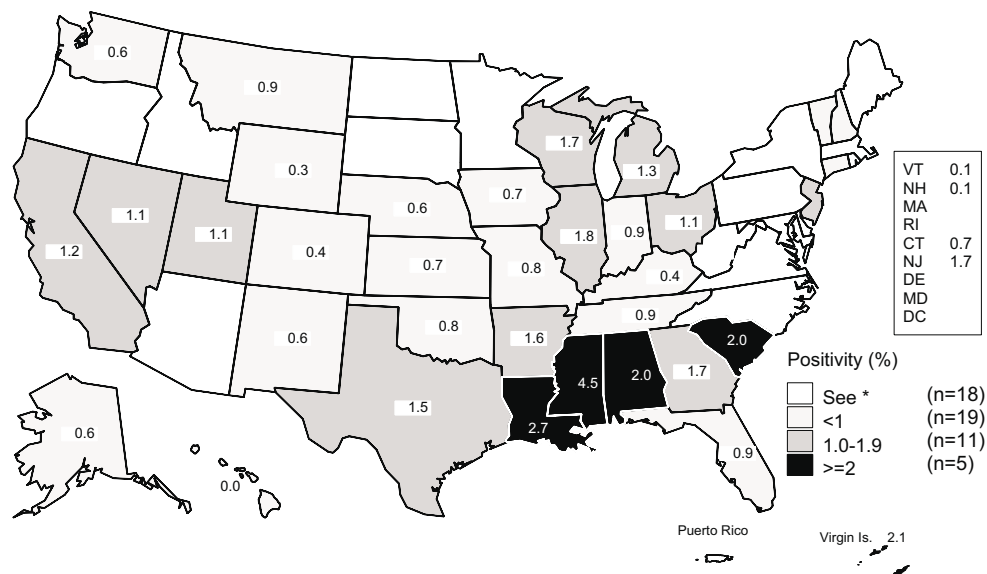


Figure 14. Gonorrhea — Age- and gender-specific rates: United States, 2000



Note: Due to methods used to impute missing age and sex data, numbers in this graph may not necessarily match those in Table 20B. See Appendix.

Figure 15. Gonorrhea — Positivity among 15-24 year old women tested in family planning clinics by state, 2000



*States reported gonorrhea positivity data on less than 500 women aged 15-24 years during 2000 except for Alaska submitting data for June-December only and Ohio submitting data for August-December only.

SOURCE: Regional Infertility Prevention Programs; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure 16. Gonococcal Isolate Surveillance Project (GISP) — Location of participating clinics and regional laboratories: United States, 2000

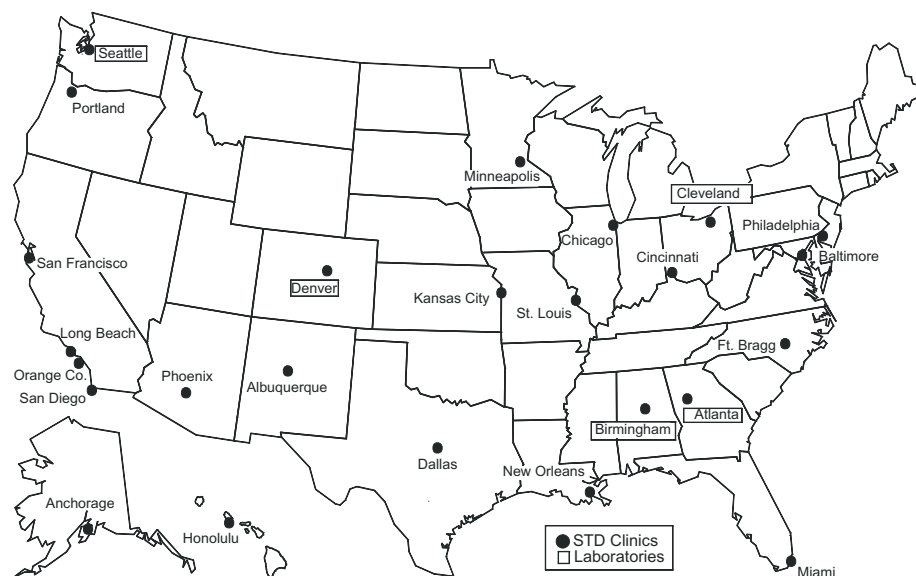
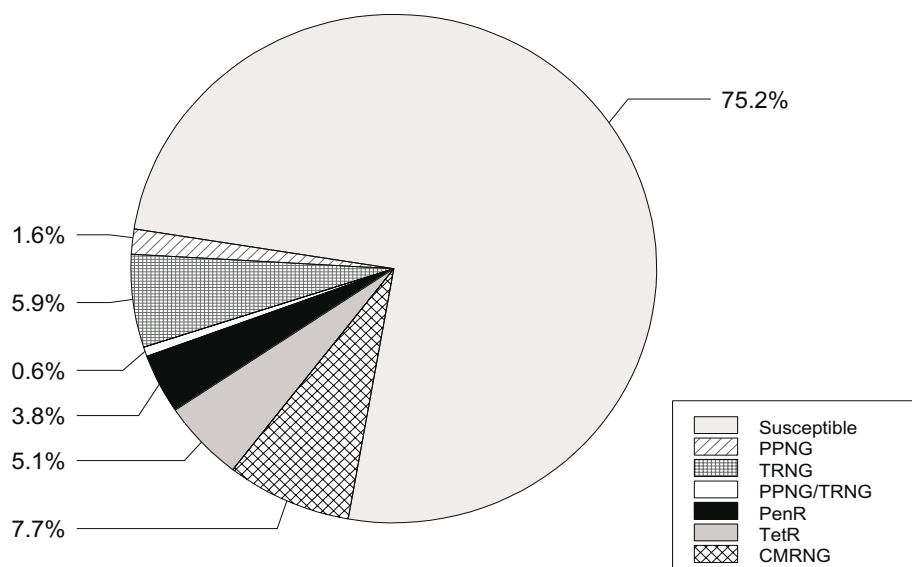
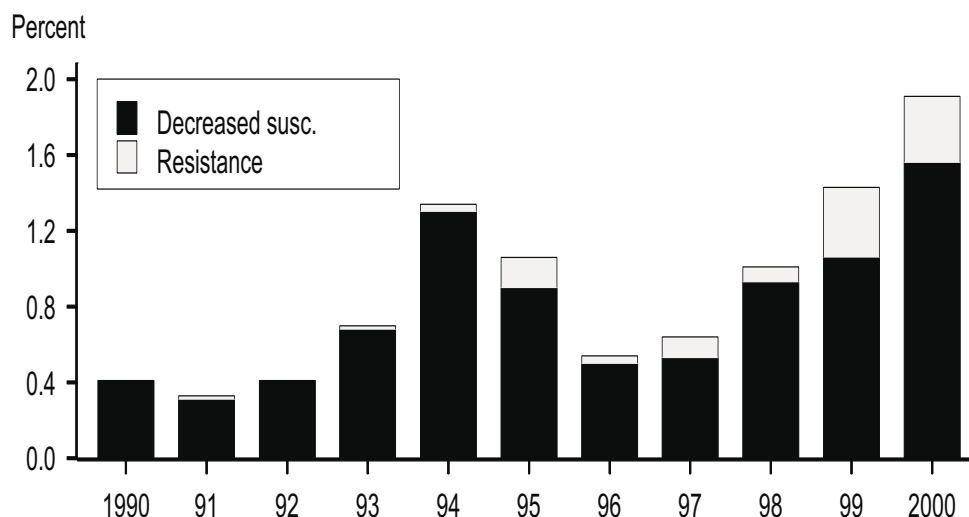


Figure 17. Gonococcal Isolate Surveillance Project (GISP) — Penicillin and tetracycline resistance among GISP isolates, 2000



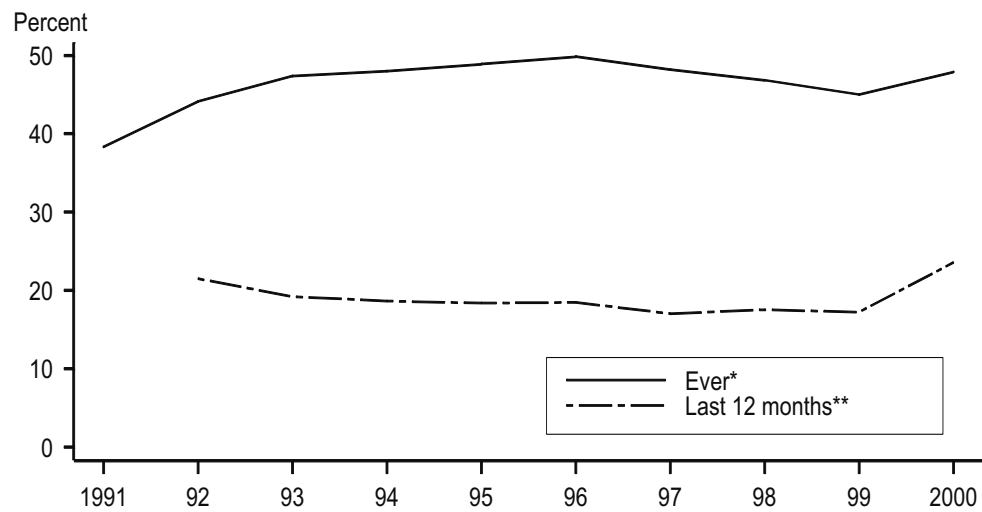
Note: PPNG=penicillinase-producing *N. gonorrhoeae*; TRNG=plasmid-mediated tetracycline resistant *N. gonorrhoeae*; PPNG-TRNG=plasmid-mediated penicillin and tetracycline resistant *N. gonorrhoeae*; PenR=chromosomally mediated penicillin resistant *N. gonorrhoeae*; TetR=chromosomally mediated tetracycline resistant *N. gonorrhoeae*; CMRNG=chromosomally mediated penicillin and tetracycline resistant *N. gonorrhoeae*.

Figure 18. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates with decreased susceptibility or resistance to ciprofloxacin, 1990–2000



Note: Resistant isolates have ciprofloxacin MICs $\geq 1 \mu\text{g/mL}$. Isolates with decreased susceptibility have ciprofloxacin MICs of $0.125 - 0.5 \mu\text{g/mL}$. There were sixty-one (61) resistant isolates: one in 1991, one in 1993, two in 1994, eight in 1995, two in 1996, five in 1997, four in 1998, nineteen in 1999, and nineteen in 2000. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

Figure 19. Gonococcal Isolate Surveillance Project (GISP) — Percent of men with gonorrhea who had a previous gonorrhea infection, 1991–2000



*Data first collected in 1991.

**Data first collected in 1992.